

IN THE CLAIMS:

1. (Currently Amended) A downhole repeater assembly comprising:

a host drill string pipe comprising a threaded pin end comprising an integral primary and integral second shoulder and a threaded box end comprising a primary shoulder and an oversize bore adjacent the primary shoulder;

a cylindrical insert housing, characterized by a proximal end and a distal end, having a substantially cylindrical wall having an outer rounded surface about equal to the oversize bore, the cylindrical wall defining a central bore passing therethrough;

the cylindrical insert housing further formed to define at least one recess in the outer rounded surface of the cylindrical wall;

a repeater circuit located within the at least one recess;

the cylindrical insert housing further comprising an axial annular recess perpendicular to the central bore and formed into at least one of the proximal end and the distal end; and

an axial annular transmission element located in the annular recess, the axial annular transmission element operably connected to the repeater,

wherein the cylindrical housing is inserted into the oversize bore and fixed in place using a secondary shoulder insert comprising engagement grooves.

2. (Original) The downhole repeater assembly of claim 1, further comprising a first channel, formed within the cylindrical housing, extending from the at least one recess to at least one of the proximal and distal end.

3. (Original) The downhole repeater assembly of claim 1, wherein the annular transmission

element inductively converts electrical energy to magnetic energy.

4. (Original) The downhole repeater assembly of claim 1, wherein the annular transmission element comprises an electrical contact to transmit electrical energy directly to another contact.
5. (Original) The downhole repeater assembly of claim 1, further comprising at least one battery located in the at least one recess.
6. (Original) The downhole repeater assembly of claim 1, wherein: the cylindrical housing is inserted into the bore of a host downhole tool; and the host downhole tool further comprises a pin end and a box end, the pin end having an external threaded portion and the box end having an internal threaded portion.
7. (Original) The downhole repeater assembly of claim 6, wherein the box end lacks an integrated secondary shoulder.
8. (Original) The downhole repeater assembly of claim 7, further comprising a secondary shoulder insert inserted into the box end, independent from the box end, capable of absorbing stresses normally incident on an integrated secondary shoulder.
9. (Original) The downhole repeater assembly of claim 8, wherein stresses normally incident on a secondary shoulder are not imposed on the cylindrical housing.
10. (Original) The downhole repeater assembly of claim 8, wherein surface characteristics of the secondary shoulder insert engage corresponding surface characteristics of the inside diameter of the host tool to transfer a load, incident on the secondary shoulder insert, to the host tool.

11. (Original) The downhole repeater assembly of claim 1, wherein the repeater circuit further comprises a data acquisition circuit to acquire data from at least one sensor.
12. (Original) The downhole repeater assembly of claim 1 1, wherein the at least one sensor is selected from the group consist of a pressure transducer, an inclinometer, a thermocoupler, an accelerometer, an imaging device, and a seismic device.
13. (Original) The downhole repeater assembly of claim 1, wherein the repeater circuit further includes components selected from the group consisting of signal filtering circuitry, signal error checking circuitry, device control circuitry, a modem, a digital signal processor, and a microcontroller.
14. (Currently Amended) A downhole module comprising: a cylindrical insert housing, characterized by a proximal end and a distal end, having a substantially cylindrical wall, the cylindrical wall defining a central bore passing therethrough; the cylindrical insert housing further formed to define at least one axial recess in the cylindrical wall; a repeater circuit located within the at least one axial recess; and a data acquisition circuit located within the at least axial one recess, connected to the repeater circuit, to acquire data from at least one sensor, the cylindrical insert housing further comprising a radial annular recess perpendicular to the central bore and formed into at least one of the proximal end and the distal end; and an axial annular transmission element located in the annular recess, the axial annular transmission element operably connected to the repeater, wherein the cylindrical housing is inserted into the oversize bore and fixed in place using a secondary shoulder insert comprising engagement grooves.
15. (Original) The downhole module of claim 14, further comprising an uphole data link

extending from the repeater circuit to the proximal end, and a downhole data link extending from the repeater circuit to the distal end.

16. (Original) The downhole module of claim 14, wherein the cylindrical housing is characterized by at least one annular recess formed into at least one of the proximal end and the distal end.

17. (Original) The downhole module of claim 16, wherein the cylindrical housing further comprises an annular transmission element located in the annular recess.

18. (Original) The downhole module of claim 14, further comprising at least one battery located in the at least one recess.

19. (Original) The downhole module of claim 14, wherein the at least one sensor is selected from the group consisting of a pressure transducer, an inclinometer, a thermocoupler, an accelerometer, an imaging device, and a seismic device.

20. (Currently Amended) A downhole repeater assembly comprising: a cylindrical insert housing, characterized by a proximal end and a distal end, having a substantially cylindrical wall, the cylindrical wall defining a central bore passing therethrough; the cylindrical housing having at least one axial recess formed into the outer rounded surface of the cylindrical wall; and a signal repeater located within the at least one axial recess the cylindrical insert housing further comprising a radial annular recess perpendicular to the central bore and formed into at least one of the proximal end and the distal end; and an axial annular transmission element located in the annular recess, the axial annular transmission element operably connected to the repeater,

wherein the cylindrical housing is inserted into the oversize bore and fixed in place using a secondary shoulder insert comprising engagement grooves.